Claims

1.A method for identifying whether a channel is a LOS channel or a NLOS channel in a mobile communication system, comprising:

A. reading in a power delay profile;

B. selecting a path with maximum power amplitude, i.e. a Maximum Path, from the power delay profile;

C. estimating an average noise power and arrival time of a First Path and the Maximum Path;

D. detecting a Local Maximum Path value within a searching window, and detecting whether a power ratio of the Maximum Path to the Local Maximum Path is greater than a threshold *K*;

E. detecting whether the arrival time difference between the First Path and the Maximum Path is less than a time interval *T*;

F. if the power ratio of the Maximum Path to the Local Maximum Path is greater than the threshold *K*, and simultaneously the arrival time difference between the First Path and the Maximum Path is less than the time interval *T*, determining the channel being a LOS channel; otherwise determining the channel being a NLOS channel.

2.The method according to Claim 1, after the step F, further comprises a step of detecting whether the NLOS channel determined by Step F is a LOS channel or a NLOS channel, by $\bar{\tau}/\sigma$ difference of the power delay profile between the LOS channel and the NLOS channel, which comprises:

G. computing τ_i that is an arrival time difference between a i^{th} detectable path and first detectable path;

H. according to following formulas, computing mean delay $\bar{\tau}$ and root-mean-square delay spread σ of each detectable path,

$$\bar{\tau} = \frac{\sum_{i=1}^{n} \tau_i * p_i}{\sum_{i=1}^{n} p_i}$$

$$\bar{\tau^2} = \frac{\sum_{i=1}^{n} (\tau_i)^2 * p_i}{\sum_{i=1}^{n} p_i}$$

$$\sigma = \sqrt{\bar{\tau^2} - (\bar{\tau})^2}$$

;

I. computing $\bar{\tau}/\sigma$ that is a ratio of mean delay to root-mean-square delay spread of power delay profile; if $\bar{\tau}/\sigma$ is less than Delta(Δ), determining the channel being a LOS channel, and if $\bar{\tau}/\sigma$ is not less than Delta (Δ), determining the channel being a NLOS channel;

wherein $\bar{\tau}$ is the mean delay of a power delay profile and σ is a root-mean-square delay spread of the power delay profile; wherein n is number of detectable paths, p_i is the i^{th} path power, and i is 1 to n.

3.The method according to Claim 2, wherein Step I comprises taking the Delta between 0.5 to 1.

4.The method according to Claims 1 or 2, wherein the Step D further comprises, if there is no detectable path in the searching window of the Local Maximum Path, taking Theta (θ) multiples of the average noise power as the Local Maximum Path power.

5.The method according to Claim 4, the Theta (θ) is taken 2.

6.The method according to Claims 1 or 2, wherein Step D comprises, selecting the said Local Maximum Path from a range within Alpha (α) microsecond that delays the Maximum Path; wherein the Alpha (α) width is greater than one chip.

7.The method according to Claims 1 or 2, wherein Step D comprises, setting the threshold K in indoor environment less than the threshold in outdoor environment, and setting the threshold in outdoor environment being 10.

8.The method according to Claims 1 or 2, wherein Step D further comprises, dividing the threshold K into $K1$ and $K2$, wherein $K1 > K2$;

wherein Step F further comprises, if the power ratio of the Maximum Path to the Local Maximum Path is greater than $K1$, determining the channel as a LOS channel; if the ratio is less than $K2$, determining that the channel is a NLOS channel; and if said ratio is between $K1$ and $K2$, determining that the channel is an undetermined channel.

9.The method according to Claim 8, the threshold *K1* is taken 10 and *K2* is taken 5.

10.The method according to Claim 1 or 2, wherein Step E comprises, taking the time interval *T* being within three chips, and typically two chips.